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5S Strategy: A workplace improvement lean tool

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ABSTARCT

5S is an important tool within Lean Manufacturing, developed as part of the Toyota Production System (TPS) and Total Productive Maintenance (TPM), it is a highly effective and simple tool to ensure the workplace is efficiently organized. The primary objective of 5S is to create a clean, orderly environment. The 5S characterize a continuous and never-ending methodology for creating and maintaining an organized, clean, and safe high-performance environment.

In a manufacturing environment, implementing 5S can result in considerable improvements in environmental performance besides with improved housekeeping and health and safety. The 5S is a set of straight forward steps towards continual improvement.

Key Words: Lean manufacturing, 5S strategy, Workplace performance, Continuous improvement

INTRODUCTION

Lean manufacturing is "A Systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of Perfection" – BY NIST (National Institute of Standards and Technology U.S.)

The benefit of good workplace include the prevention of defects; prevention of accidents; and the elimination of time wasted for searching tools, documentation and other ingredients of manufacture**[1].** The 5S is the methodology of creation and maintaining well organized, clean, high effective and high quality workplace. Its result is the effective organization of the workplace, elimination of losses connected with failures and breakdowns in machines, improvement of the quality and safety of work.

The implementation of 5S is crucial as it serves as stepping stones to create a strong housekeeping culture in the organization **[2].**

The philosophy of the 5S has its roots in Japan. Name 5S is the acronym of five Japanese words of the following meanings:

1. Seiri (Sort),
2. Seiton (Set in order),
3. Seiso (Shine),
4. Seiketsu (Standardize),

5. Shitsuke (Sustain).

Company background

Sunmill Industries Pvt. Ltd is situated in Shiroli M.I.D.C. Kolhapur, Maharashtra (India) commenced in 2001 for manufacturing of automobile parts, jigs and fixtures, dies etc. The company is engaged in machining of automotive parts such as Suspension Bracket (John Deere), Steering Control Unit (Eton), Linday Housing (Dana India Pvt. Ltd.) and Header HA2 (Kirloskar Oil Engine Ltd.). In company employees were working in uncomfortable, dirty, messy environment which was usually full of unused materials and clutter.

Sunmill Industries wants to overcome from this situation and provide healthy and pleasant working environment to the workers, so that they can work efficiently.

RESULT AND DISCUSSION

5S Strategy at Sunmill Industries

5S strategy is consisting set of 5 steps for continuous improvement with respect to the organizational performance.

The original concept was based on five Japanese words that begin with "S", i.e. Seiri, Seiton, Seiso, Seiketsu, and Shitsuke. The English equivalents are Sort, Set in order (Simplify), Shine (Swipe), Standardize, and Sustain. **[3]**

Fig.1. 5S Strategy

In Sunmill Industries implementation of 5S started with formation of zones, teams, selection of team leaders and training to team members and all employees in the organization. Then 5S implementation begins with implementation of sequential 5 steps.

The first "S" Sort is related with workplace improvement and clutter reduction. For effective utilization of sort materials, equipments, inventories etc. are categorized in to required, might be required and not required. Further required items distributed into frequently required, occasionally required, rarely required.

For distinguish between required and not required items red tag is used, which includes item description, category, reason of tagging, action to be taken and remark. Not required items are transferred to store, red tag zone or wherever required.

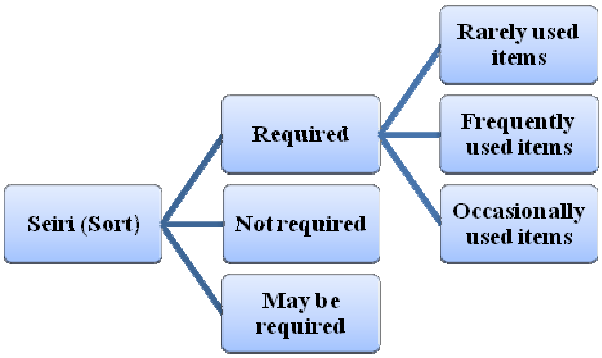

Fig. 2. Basis for sort

Photo1. Before sorting

Photo2. During sorting

The second "S" stands for Seiton (set in order), during this stage the materials which are previously sorted assigns places. The set in order is about *"A place for everything, everything at its place"*. While assigning places for materials ABC analysis of materials can be done as basis.

After set in order it is possible to store and retrieve material quickly, which reduces the searching time (i.e. non productive time).

Photo3. During sorting

Table1. ABC analysis for assigning place

Frequency of utilization	Class	At hand	NEAR	Remote location
Several times a day, daily	**A**	**YES**	**YES, if not on workplace**	**NO**
Weekly	**B**	**Eventually**	**YES**	**NO**
Monthly, quarterly, semester, once in a year	**C**	**NO**	**NO**	**YES**

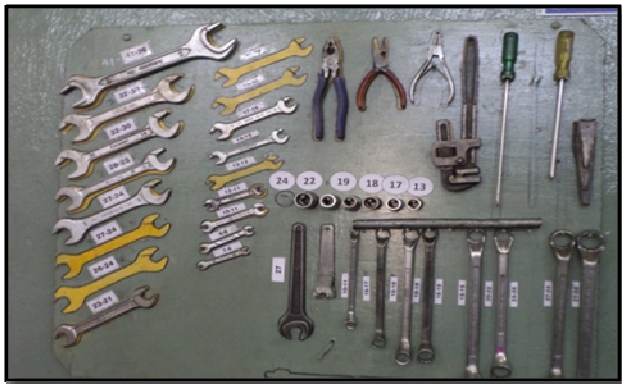

Photo4. During set in order

Photo4. During set in order

The third "S" stands for Seiso (Shine), during this stage all materials, machines, gauges, equipments, work areas are cleaned. During shine stage it is possible to find out problems in machines, equipments and also sources of dirt.

Regular cleaning permits to identify and to eliminate sources of disorder and to maintain the clean workplaces. During cleaning it is checked the cleanness of machine, workplace and floor, tightness of equipment, cleanness of lines, pipes, sources of light.

After 3 steps of the 5S strategy, it is important to maintain these implemented steps to run everything smoothly. Standardization is the way, to help the company to set the normal conditions on shop floor.

For effective implementation of 5S strategy standard working procedure is formed and displayed on shop floor at Sunmill Industries. All the shop floor is marked with paints to distinguish the areas, all materials; tools; equipments are tagged, panels; gauges; switches are marked with their names.

Photo5. During Shine

Photo6. Location Allocation for material

Photo7. Shop floor during 5S implementation

Photo8. Displays on machines

Although results can be achieved very quickly by the use of 5S strategy, but for continual improvements there must be the self-discipline to move forward. SUSTAIN is about the mental and physical disciplines required to maintain the other 4S items. Often people achieve the 'discipline' to maintain 5S through the use of routines, including self assessments, audits and checklists with the results visually displayed and regularly reviewed.

To maintain all 4S, regular work instructions are displayed on each machine so it becomes easy to new worker to work in the industry to maintain discipline. It is necessary to work every day for 5 to 10 min at the start and end of each shift to maintain 5S.

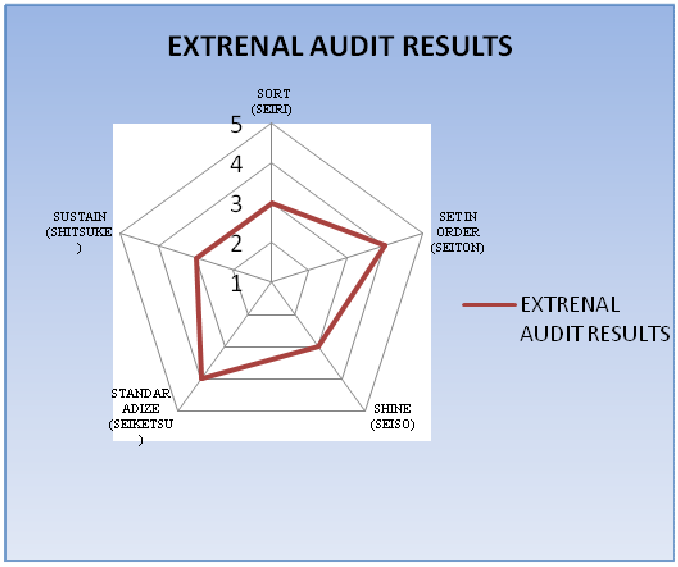

Chart1. External audit results

CONCLUSION

The 5S is an environmental management tool that may be used to introduce good environmental management practice effectively and subsequently be used to improve environmental performance continually alongside housekeeping and health and safety.

Sort helped Sunmill industries to decide between used and not used items, in addition, the company got more space from that. Set in order reduces the time that personnel in the company need to search for tools and equipments. Shine made the working environment look better than the previous situation. Standardized and sustain are working for keeping all steps going forward. Employees in the organization become self disciplined.

5S practice in company will lead to higher quality and productivity, reduced defects rework, more efficient utilization of space.

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